Course Curriculum of 3-Year M.C.A Degree Programme

(Batch- 2018-21)

Credit Structure

Distribution of Total Credits & Contact Hours in all Semesters

S. No.	Semester Number	Credits/Semester	Contact hours/week
1	I	30	40
2	II	28	36
3	III	28	36
4	IV	28	36
5	V	28	36
6	VI	18	36
	Total	160	220

Course Structure: M.C.A. 2018-21

Semester - I

S. No.	Course Code	Course Title	L	T	P	Credit(s)
1	MCA-T101	Principles of Programming Languages	3	1	0	4
2	MCA-T102	Computer Organisation	3	1	0	4
3	MCA-T103	Communication Skills	3	1	0	4
4	MCA-T104	Numerical Methods & Computation	3	1	0	4
5	MCA-T105	Principles of Management	3	1	0	4
6	MCA-P101	Principles of Programming Languages and Numerical Methods Lab	0	0	8	4
7	MCA-P102	Microprocessor Lab	0	0	8	4
8	MCA-S101	Skill Course	0	0	4	2
					Total Credits	30
					Total Contact hours/week	40

Semester - II

S. No.	Course Code	Course Title	L	T	P	Credit(s)
1	MCA-T201	Fundamentals of Computers and PC Packages	3	1	0	4
2	MCA-T202	Data Structure	3	1	0	4
3	MCA-T203	Object Oriented Programming	3	1	0	4
4	MCA-T204	Discrete Mathematics	3	1	0	4
5	MCA-T205	MIS and E-Commerce	3	1	0	4
6	MCA-P201	Data Structure with Object Oriented Programming Lab	0	0	8	4
8	MCA-P202	PC packages Lab	0	0	8	4
					Total Credits	28
					Total Contact hours /week	36

Semester – III

S. No.	Course Code	Course Title	L	T	P	Credit(s)
1	MCA-T301	Computer Architecture	3	1	0	4
2	MCA-T302	Design & Analysis of Algorithms	3	1	0	4
3	MCA-T303	Computer Networks	3	1	0	4
4	MCA-T304	Operating System	3	1	0	4
5	MCA-T305	Programming in JAVA	3	1	0	4
6	MCA-P301	Operating System Lab	0	0	8	4
8	MCA-P302	JAVA Lab	0	0	8	4
					Total Credits	28
					Total Contact hours /week	36

Semester – IV

S. No.	Course Code	Course Title	L	T	P	Credit(s)
1	MCA-T401	Database Management System	3	1	0	4
2	MCA-T402	Web Technologies	3	1	0	4
3	MCA-T403	Introduction to Software Engineering	3	1	0	4
4	MCA-E404	Departmental Elective – I	3	1	0	4
5	MCA-E405	Departmental Elective – II	3	1	0	4
6	MCA-P401	Minor Project Lab	0	0	8	4
7	MCA-P402	DBMS Lab	0	0	8	4
					Total Credits	28
					Total Contact hours/week	36

Semester – V

S. No.	Course Code	Course Title	L	T	P	Credit(s)
1	MCA-T501	Artificial Intelligence & Machine Learning	3	1	0	4
2	MCA-T502	Compiler Design	3	1	0	4
3	MCA-E503	Departmental Elective – III	3	1	0	4
4	MCA-E504	Departmental Elective – IV	3	1	0	4
5	MCA-OE505	Open Elective	3	1	0	4
6	MCA-P501	Machine Learning Lab	0	0	8	4
7	MCA-P502	Lab based on Elective – III(MCA-E503)	0	0	8	4
					Total Credits	28
					Total Contact hours/week	36

Semester - VI

S. No.	Course Code	Course Title	L	T	P	Credit(s)
1	MCA-T601	Project Work	0	0	36	18
					Total Credits	18

List of Departmental Elective(s) – I

S. No.	Course Code	Course Title	L	T	P	Credit
1	MCA-E404-1	Software Testing	3	1	0	4
2	MCA-E404-2	Real Time Systems	3	1	0	4
3	MCA-E404-3	Cryptography & Network Security	3	1	0	4
4	MCA-E404-4	Computer Graphics	3	1	0	4
5	MCA-E404-5	Graph Theory	3	1	0	4

List of Departmental Elective(s) – II

S. No.	Course Code	Course Title	L	T	P	Credit
1	MCA-E405-1	Mobile Computing	3	1	0	4
2	MCA-E405-2	Cloud Computing	3	1	0	4
3	MCA-E405-3	Image Processing	3	1	0	4
4	MCA-E405-4	Agile Methodologies	3	1	0	4
5	MCA-E405-5	Parallel Computing	3	1	0	4
6	MCA-E405-6	Information Systems & Cyber Security	3	1	0	4
7	MCA-E405-7	Robotics	3	1	0	4

List of Departmental Elective(s) - III

S. No.	Course Code	Course Title	L	T	P	Credit
1	MCA-E503-1	Open Source Operating Systems and Shell Programming	3	1	0	4
2	MCA-E503-2	Embedded Systems	3	1	0	4
3	MCA-E503-3	Ethical Hacking and Digital Forensics	3	1	0	4
4	MCA-E503-4	Mobile Application Development	3	1	0	4
5	MCA-E503-5	Python Programming	3	1	0	4
6	MCA-E503-6	Data Mining and Data warehousing	3	1	0	4

List of Departmental Elective(s) - IV

S. No.	Course Code	Course Title	L	T	P	Credit
1	MCA-E504-1	Bio-Informatics	3	1	0	4
2	MCA-E504-2	Internet of Things	3	1	0	4
3	MCA-E504-3	Soft Computing	3	1	0	4
4	MCA-E504-4	Ad Hoc Networks	3	1	0	4
5	MCA-E504-5	Distributed Databases	3	1	0	4
6	MCA-E504-6	Natural Language Processing	3	1	0	4

List of Open Elective(s)

S. No.	Course Code	Course Title	L	T	P	Credit
1	MCA-OE505-1	Communication Through Drama	3	1	0	4
2	MCA-OE505-2	Professional Ethics & Morals	3	1	0	4
3	MCA-OE505-3	Intellectual Property Rights & Patents	3	1	0	4
4	MCA-OE505-4	Entrepreneurship	3	1	0	4
5	MCA-OE505-5	Operations Research	3	1	0	4
6	MCA-OE505-6	Research Methodologies	3	1	0	4
7	MCA- OE505-7	Number Theory	3	1	0	4
8	MCA- OE505-8	Modern Algebra	3	1	0	4
9	MCA- OE505-9	Digital Marketing	3	1	0	4

M.C.A. SEMESTER - I

MCA-T101 Principles of Programming Languages

UNIT I

Algorithm development: problem identification, algorithms, flow charts, testing and debugging, algorithms for searching (linear and binary), sorting (selection, bubble & insertion), merging of ordered list, analysis of algorithm.

UNIT II

An Introduction to Programming Languages and Evolution of Major Programming Languages Categories of programming languages: Procedural, Object Oriented, Prototype, Scripting, Programming, syntax and semantics, binding and scoping rules

UNIT III

Elementary Data Types, Expressions and Assignment Statements, Statement-Level Control Structures, Structured data types, Vectors, Arrays, lists, Sets, Files

UNIT IV

Subprograms, Implementing Subprograms, Recursion, Exception Handling, Static and stack based storage management, Fixed and variable Size heap storage management, Garbage collection.

UNIT V

Object oriented Concepts: Object, Class, Data Abstraction, Encapsulation, Polymorphism, and Inheritance, Access specifiers: Private public protected, overloading and overriding of functions.

Recommended Books

1. Programming Languages design and implementation, Pratt, Pearson.
2. Programming languages: concepts and constructs, Ravi Sethi.
3. Programming Language Pragmatics, Scott, Elsevier.
4. Programming Language Concepts, Ghezzi and Jazayeri . John Wiley & Sons
5. Programming Languages- Principles and Practice, Louden, Cengage Publications.
6. Essential of Programming Languages, Friedman and Wand, PHI.
7. Concept of programming language, Sebasta, Addison Wesley.

MCA-T102 Computer Organization

UNIT I

Introduction: Structured Computer Organization: languages, levels and virtual machines, contemporary multilevel machines, evolution of multilevel machines. Milestones in Computer Architecture: various generations. The computer Zoo: technological and economic forces, the computer spectrum. Example-computer families.

UNIT II

Computer System Organization: Computer Systems Organization: Processors: CPU organization, instruction execution, RISC versus CISC, design principles for modern computers, instruction-level parallelism, processor-level parallelism. Primary Memory: Bits, memory addresses, byte ordering, error-correcting codes, cache memory, memory packaging and types. Secondary Memory: Memory hierarchies, magnetic disks, floppy disks, IDE disks, SCSI disks, RAID, CD-ROMs, CD-Recordable, DVD. INPUT/OUTPUT: Buses, terminals, mice, printers, modems, character codes.

UNIT III

Digital Logic Level: The Digital Logic Level: Gates and Boolean algebra: Gates, Boolean algebra, implementation of Boolean functions, circuit equivalence. Basic Digital Logic Circuits: Integrated circuits, combinational circuits, arithmetic circuits, clocks. Memory: Latches, flip-flops, registers, memory organization, memory chips, RAMs and ROMs. CPU Chips and Buses: CPU chips, computer buses, bus width, bus clocking, bus arbitration, bus operations. Example CPU chips and buses. Interfacing: I/O chips, address decoding.

UNIT IV

The Micro-Architecture Level: The Micro-architecture Level: An example micro-architecture: The data path, micro- instructions, micro-instruction control the MIC-1. An example ISA: IJVM: Stacks, the IJVM memory model, the IJVM instruction set, compiling Java to IJVM. An example implementation: micro-instruction and notation, implementation of IJVM using Mic-1. Design of the micro-architecture level: Speed versus cost, reducing the execution path length, a design with pre-fetching the Mic-2, a pipelined design the Mic-3, a seven-stage pipeline the Mic-4. Improving performance: Cache memory, branch prediction, out-of-order execution and register renaming, speculative execution. Examples of the micro-architecture level.

UNIT V

Microprocessors: Microprocessors: Architecture of 8085 microprocessor; instructions of 8085, addressing modes, introduction to assembly language programming.
Recent Developments in Computer Hardware (CPU, Chipsets, memories, disks & interfaces used in desktops)

Recommended Books

1. Structured Computer Organization, A.S.Tannenbaum, Pearson.
2. Introduction to microprocessors, Ramesh Gaonkar, Prentice Hall.
3. Digital Computer Fundamentals, Thomas C. Bartee, Tata McGraw-Hill Publishing.
4. Microprocessors and Interfacing: programming and Hardware, Duglus V. Hall, Glencoe.

MCA-T103 Communication Skills

UNIT I

Basic language skills and grammar: Phonetics and accent, Features of Indian English, Correction of sentences, structures, Tenses, ambiguity, Idiomatic distortions.

UNIT II

Theories of Communication: Importance of Communication, Communication, Process, Channels of communication, Significance of, Feedback, Barriers to Effective Communication, Ways to overcome the Barriers. Informal conversation Vs Formal expression Verbal and non-Verbal communication, barriers to effective communication, kinesics

UNIT III

Written communication: Differences between spoken and written communication, features of effective writing such as clarity brevity, appropriate tone clarity, balance etc. Précis Writing - expressing the presented ideas in concise and accurate manner

UNIT IV

Business Communication: Business and Technical report writing, types of reports, progress reports, routine reports, Annual reports, format, Analysis of sample reports from industry, Synopsis and thesis writing. Letter writing, format and style, effectiveness, promptness, Analysis of sample letters and emails collected from Business.

UNIT V

Vocabulary and English for businesses: Reading newspapers, business news, magazines to build vocabulary for the business communication. Reading Comprehension, Comprehending notices, advertisements, official documents, booklets, newspapers, instructional manuals and other documents.

Recommended Books

1. Business Communication Today, Bovee, Courtland, John Thill & Mukesh Chaturvedi, Dorling Kindersley.
2. Business Communication, Kaul, Asha, Prentice-Hall of India.
3. Business Communication Strategies, Monippally, Matthukutty M., Tata McGraw-Hill Publishing Company Ltd. , New Delhi.
4. Communication Skills for Engineers and Scientists, Sharma, Sangeeta and Binod Mishra PHI Learning Pvt. Ltd, New Delhi.
5. Essentials of Business Communication, Rajendra Pal, JS Korlahhi, Sultan Chand & Sons, New Delhi.
6. Advanced Communication Skills, V. Prasad, Atma Ram Publications, New Delhi.
7. Business Communication; Theory and Application, Raymond V.Lesikav, John D. Pettit Jr., All India Traveller Bookseller, New Delhi
8. Business Communication, RK Madhukar, Vikas Pulishing House Pvt. Ltd.
9. English for Technical Communication, KR Lakshiminarayana, SCITECH Publications (India)
10. Writing Remedies: Practical Exercises for Technical Writing Edmund H weiss, Universities Press, Hyderabad.

MCA-T104 Numerical Methods and Computation

UNIT 1

Floating point Arithmetic: Basic Concepts of floating point number systems, implications of finite precision, Illustration of errors due to round off. Solution of non-linear Equations: Bisection, Fixed point iteration, Newton's method, rates of Convergence.

UNIT II

Direct Methods for Linear Systems of Equations: Gaussian elimination, Operational counts, Implementation including pivoting and scaling. Iterative methods: Jacobi's method, Gauss Seidal method, Acceleration of iterative methods, Relaxation method.

UNIT III

Computation of Eigen values and Eigen vectors: Basic theorems, Eigen values and Eigen vectors, Error estimates, the power method, Jacobi's method, Matrices, determinants, LU decomposition.

UNIT IV

Interpolation and approximation: Finite Differences, Difference tables, Polynomial Interpolation: Newton’s forward and backward formula, Central Difference Formulae: Gauss forward and backward formula.

UNIT V

Numerical Differentiation and Integration:
Numerical Differentiation, Taylor series method, Euler’s methods, Runge-Kutta Methods, Predictor-Corrector methods
Numerical Integration: Trapezoidal rule, Simpson’s rules.

Recommended Books

1. Numerical Methods for Scientists and Engineers, K. Sankara Rao
2. Computer Oriented Numerical Methods, V. Rajaraman

MCA-T105 Principles of Management

UNIT I

Business and Management: Business Meaning and Contents, Business as a system, Business Environment.

Management Concept and Nature, Management Process, Basic function of Management, Management Level, Role of Manager, Management Principles (Henry fayol's principle of management, Taylor's Scientific Management) .

UNIT II

Organizational Behavior: Need of Understanding human behaviour in organization, Challenges and Opportunities for OB.

Management by Objective (MBO), Decision making process and models, Conflict Management, Strategies & Policies.

UNIT III

Managing Personnel: HRM- Meaning and Functions, Man Power Planning, Job Analysis and Design, Training, Career Planning & Development.

Motivation Theories & Practices, Leadership Concept theories & Style, Compensation Management.

UNIT IV

Marketing Management and Finance: Basic Concepts of Marketing, Nature & Scope of Marketing, Sales Promotion, Product Life Cycle, Marketing Information System (MIS) and Marketing Research.

Main Sources of Finance, Concept of Fixed & Working Capital, Introduction of Tax, Income Tax, Service Tax & VAT, Basic Concept of Invoice & Quotations.

UNIT V

Case Study: IT & BPO Industry, HR & Finance, Case Study of Local Industry with around Hundred Employees, Industry Visit, Project.

Recommended Books

1. Business Organization and Management Functions, B.P.Singh & T.N. Chabbra, Dhanpat Rai & Co.
2. Principles of Management, P.C Tripathi & P. N. Reddy, Tata McGraw Hill Publishing
3. Principles and Practices of Management, L.M. Prasad & Stephen P. Robbins
4. Organizational Behavior, Prentice Hall of India.
5. Human Resource Management, K. Aswathappa, Tata McGraw Hill
6. Marketing Management, Philip Kotler, Prentice Hall of India.
7. Marketing Management: Planning, Control, Ramaswamy. V.S. and Namakumari.S. MacMillan.
8. Financial Management,Principles and Practices, Dr. S.N. Maheshwari), S. Chand &Sons.

MCA-P101 Principles of Programming Languages and Numerical Methods Lab

Lab based on paper MCA-T101and MCA-T104

MCA-P102 Microprocessor Lab

Lab based on paper MCA-T102

MCA-S101 Skill Course